



USER GUIDE

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This equipment complies
with the EMC Directive
89/336/EEC

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Part No. ZM0228
Issue 1

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FIVE Monitor

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FIVE Monitor

1

Introduction

Introduction

Congratulations on purchasing a Soundcraft console.

Series FIVE Monitor is a dedicated Monitor mixing console designed to meet the exacting requirements of major tours and installations.

System Overview

- Available in two versions: 24+2 or 32+2 bus
- Frame sizes from 40-60 mono inputs
- Optional stereo input module
- 4-band parametric EQ on all inputs including stereos
- Sends can be globally configured as mono or stereo
- Comprehensive output matrix built-in
- 8 VCA Groups plus 8 Mute groups
- Remote control of BSS Varicurve via midi
- LED input metering plus VU output metering

Power Supply

- The FIVE Monitor uses the CPS2000 Power Supply.

Warranty

1 **Soundcraft** is a trading division of Harman International Industries Ltd .

End User means the person who first puts the equipment into regular operation.

Dealer means the person other than Soundcraft (if any) from whom the End User purchased the Equipment, provided such a person is authorised for this purpose by Soundcraft or its accredited Distributor.

Equipment means the equipment supplied with this manual.

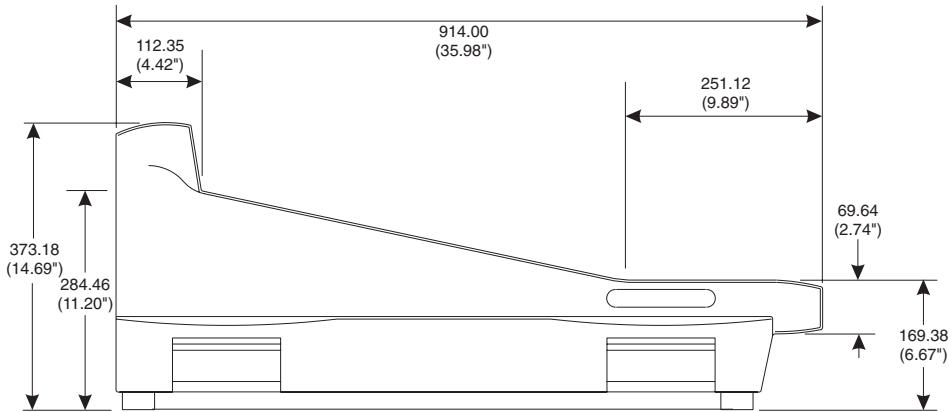
- 2 If within the period of twelve months from the date of delivery of the Equipment to the End User it shall prove defective by reason only of faulty materials and/or workmanship to such an extent that the effectiveness and/or usability thereof is materially affected the Equipment or the defective component should be returned to the Dealer or to Soundcraft and subject to the following conditions the Dealer or Soundcraft will repair or replace the defective components. Any components replaced will become the property of Soundcraft.
- 3 Any Equipment or component returned will be at the risk of the End User whilst in transit (both to and from the Dealer or Soundcraft) and postage must be prepaid.
- 4 This warranty shall only be available if:
 - a) the Equipment has been properly installed in accordance with instructions contained in Soundcraft's manual; and
 - b) the End User has notified Soundcraft or the Dealer within 14 days of the defect appearing; and
 - c) no persons other than authorised representatives of Soundcraft or the Dealer have effected any replacement of parts maintenance adjustments or repairs to the Equipment; and
 - d) the End User has used the Equipment only for such purposes as Soundcraft recommends, with only such operating supplies as meet Soundcraft's specifications and otherwise in all respects in accordance Soundcraft's recommendations.
- 5 Defects arising as a result of the following are not covered by this Warranty: faulty or negligent handling, chemical or electro-chemical or electrical influences, accidental damage, Acts of God, neglect, deficiency in electrical power, air-conditioning or humidity control.
- 6 The benefit of this Warranty may not be assigned by the End User.
- 7 End Users who are consumers should note their rights under this Warranty are in addition to and do not affect any other rights to which they may be entitled against the seller of the Equipment.

FIVE Monitor

2

Installation

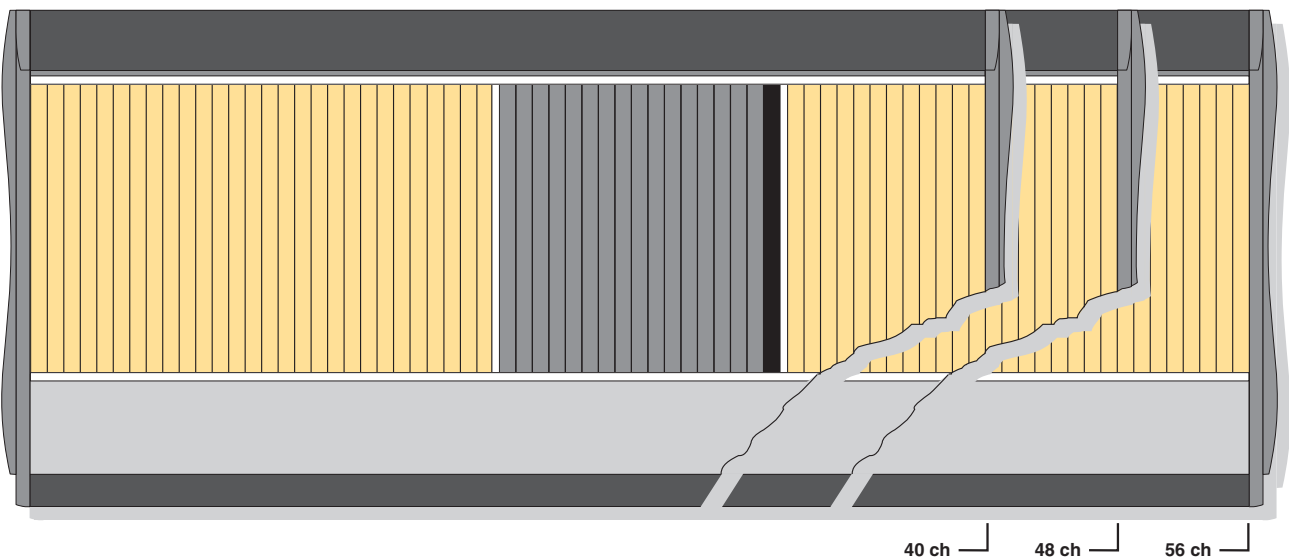
Dimensions



All dimensions are in millimeters (inches in brackets)

CONSOLE	TOTAL WIDTH	WEIGHTS
32-bus, (24-bus, 44ch), 40ch	2007.80 (79.05")	156kg (343lbs)
32-bus, (24-bus, 52ch), 48ch	2269.80 (89.36")	170kg (374lbs)
32-bus, (24-bus, 60ch), 56ch	2531.80 (99.67")	185kg (407lbs)

- Mono Input
- Output
- Master



Precautions and Safety Instructions

General Precautions

Avoid storing or using the mixing console in conditions of excessive heat or cold, or in positions where it is likely to be subject to vibration, dust or moisture. Do not use any liquids to clean the fascia of the unit: a soft dry brush is ideal. Use only water or ethyl alcohol to clean the trim and scribble strips. Other solvents may cause damage to paint or plastic parts.

Avoid using the console close to strong sources of electromagnetic radiation (e.g. video monitors, high-power electric cabling): this may cause degradation of the audio quality due to induced voltages in connecting leads and chassis. For the same reason, always site the power supply away from the unit.

Caution!

In all cases, refer servicing to qualified personnel.

Handling and Transport

The console is supplied in a strong crate. If it is necessary to move it any distance after installation it is recommended that this packing is used to protect it. Be sure to disconnect all cabling before moving. If the console is to be regularly moved we recommend that it is installed in a foamlined flightcase. At all times avoid applying excessive force to any knobs, switches or connectors.

Power Supplies & cables

Always use the power supply and cable supplied with the mixer: the use of alternative supplies may cause damage and voids the warranty; the extension of power cables may result in malfunction of the mixing console.

Warning!

Always switch the power supply off before connecting or disconnecting the mixer power cable, removing or installing modules, and servicing. In the event of an electrical storm, or large mains voltage fluctuations, immediately switch off the PSU and unplug from the mains.

Warning!

Use only the Soundcraft CPS2000 power supply with your console.

Signal Levels

It is important to supply the correct input levels to the console, otherwise signal to noise ratio or distortion performance may be degraded; and in extreme cases, damage to the internal circuitry may result. Likewise, on all balanced inputs avoid sources with large commonmode DC, AC or RF voltages, as these will reduce the available signal range on the inputs. Note that 0dBu = 0.775V RMS.

Mains Installation

General Wiring Procedures

To take full advantage of the excellent signal to noise ratio and low distortion of Soundcraft consoles care must be taken to ensure that incorrect installation and wiring does not degrade the performance of the desk. Hum, buzz, instability and Radio Frequency interference can usually be traced to earth loops and inferior earthing systems. In some areas, especially heavily industrial areas, the incoming mains earth will not be adequate and a separate technical earth for all the audio equipment must be supplied. However, check with your local electricity supply company to ensure that safety regulations are not infringed or negated.

The successful, hum free, installation of a system requires forethought, and the establishment of a set of ground rules, which must be consistently adhered to at all stages of installation.

Initial Wiring Considerations

For optimum performance, it is essential for the earthing system to be clean and noise free, as all signals are referenced to this earth. A central point should be decided on for the main earth point system, and all earths should be 'star fed' from this point. It is common electrical practice to 'daisy chain' the earths to all electrical outlets but this method is unsuitable for audio installations. The preferred method is to run an individual earth wire from each outlet, back to the system star point to provide a safety earth screen reference for each piece of equipment.

A separate earth wire should also be run from each equipment rack and area, to the star point. This may or may not be used depending on circumstances, but it is easier to install in the first place, than later when problems arise.

The location of the star point should be a convenient, easily accessible place, preferably at the rear of the console or in the main equipment rack.

Install separate 'clean' and 'dirty' mains outlets, wired individually back to the incoming mains distribution box. Use the 'clean' supply for all audio equipment and the 'dirty' supply for all lighting, etc. Never mix the two systems.

If necessary, to provide sufficient isolation from mains borne interference, install an isolating transformer. This should be provided with a Faraday Shield which must be connected with earth.

Never locate the incoming mains distribution box near audio equipment, especially tape recorders, which are very sensitive to electro-magnetic fields.

Ensure that all equipment racks are connected to earth, via a separate wire back to the star point.

Equipment which has unbalanced inputs and outputs may need to be isolated from the rack to prevent earth loops.

Audio Wiring

Having provided all equipment with power and earthing connections, consideration must be given to the method of providing audio interconnection and adequate screening of those interconnections. This must be done in a logical sequence to avoid problems and assist in the localisation of problem equipment.

- Connect the Monitor system to the console and check for any hum, buzz, or RFI. Only when you are satisfied with the quietness of the console and the monitor system should you proceed with the next step.
- Connect stereo tape recorders, echo and foldback sends one at a time, checking and isolating any connection which degrades performance.
- Connect all other peripheral devices.

- Connect all microphone lines.

By following this sequence much time and future trouble will be saved, and the result will be a quiet, stable system.

Shielding

Audio equipment is supplied with a variety of input and output configurations, which must be taken into consideration when deciding where the screen connections should be made. There are three sources of unwanted signal being impressed on the screen, which are as follows:

- Extraneous electrostatic or electromagnetic fields.
- Noise and interference on the earth line.
- Capacitive coupling between the screen and signal wires.

To minimise the adverse affects of the unwanted coupling to the signal wires, it is important that the screen is connected at one end only, i.e. the screen must not carry any signal current. Any signal on the wires within the screen will be capacitively coupled to the screen. This current will ultimately be returned to the source of the signal, either directly, if the screen is connected at the signal source end, or indirectly via the earthing system, if the signal is connected at the signal destination end. The indirect connection will cause an increase in high frequency cross-talk, and should be avoided wherever possible.

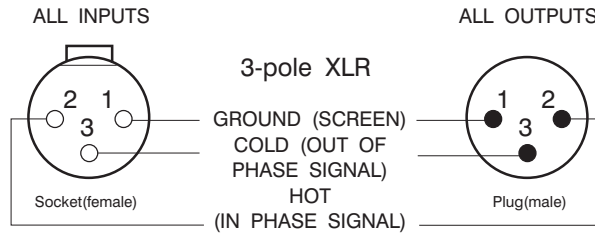
Therefore, in general, always connect the shield only at the signal source end. In high RF areas, the screen can also be connected to earth via a $0.01\mu\text{F}$ capacitor. This will present a short circuit at RF frequencies, thus lowering the effective shield impedance to ground. However, at low audio frequencies the reactance of the capacitor will be sufficiently high not to cause an earth loop problem.

Points to Remember

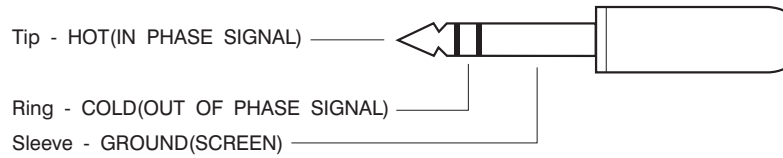
- In all cases, use good quality twin screened audio cable. Check for instability at the output.
- Always connect both conductors at both ends, and ensure that the screen is only connected at one end.
- Do not disconnect the mains earth from each piece of equipment. This is needed to provide both safety and screen returns to the system star point.
- Equipment which has balanced inputs and outputs may need to be electrically isolated from the equipment rack and/or other equipment, to avoid earth loops.

It is important to remember that all equipment which is connected to the mains is a potential source of hum and interference and may radiate both electrostatic or electromagnetic radiation. In addition, the mains will also act as a carrier for many forms of RF interference generated by electric motors, air-conditioning units, thyristor light dimmers etc. Unless the earth system is clean, all attempts to improve hum noise levels will be futile. In extreme cases there will be no alternative but to provide a completely separate and independant 'technical earth' to replace the incoming 'noisy earth'. However, always consult your local electricity supply authority to ensure that safety regulations are not being infringed.

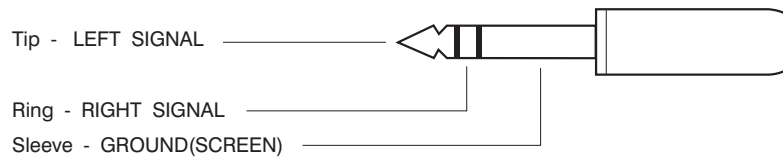
Audio Connectors



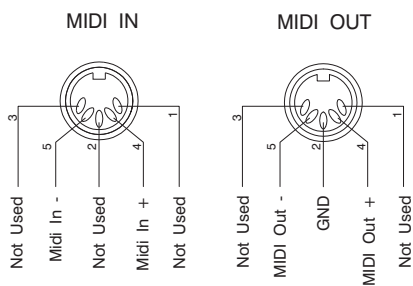
1/4" Stereo Jack Plug used as balanced Input/Output, inc. Insert Send/Return



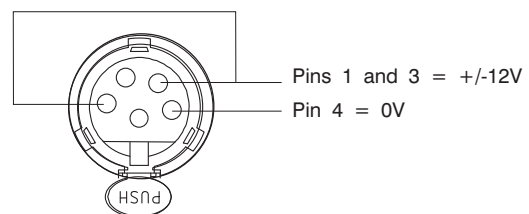
1/4" Stereo Jack Plug used for Headphones



MIDI Connectors



Lamp Connectors



Jumper Options

Mono Input Module (SC 3917)

Jumper	Function	Default	Option	Option
JMP 1-6	Channel Insert Position	J1/2/3 Pre EQ	J4/5/6 Post EQ	
JMP 7-9	Prefade Source Select GRPS L+R	J7 Pre Fade	J8 Pre Mute	J9 Pre EQ
JMP 10-12	Prefade Source Select GRPS 9-16	J10 Pre Fade	J11 Pre Mute	J12 Pre EQ
JMP 13-15	Prefade Source Select GRPS 1-8	J13 Pre Fade	J14 Pre Mute	J15 Pre EQ
JMP 16-18	Direct Output Source	J18 Post I/P Amp	J17 Pre Fade	J16 Post Fade
JMP 19	Pre EQ Mute	Enabled	Disabled	
JMP 20	Pre Mute Source	Post Post EQ Insert	Pre Post EQ Insert	
JMP 21-23	Meter Source	J21 Post I/P Amp	J22 Pre Mute	J23 Post Fade

Master Module LH PCB (SC3923)

J1	Talk Back to Foh DC Signal	Enabled	Disabled
J2	Oscillator Routing to Buses	32 Bus	24 Bus
J3	Wedge Source If no Solo	No Signal	GRPL+R

VCA Fader (SC3926)

J1-8	VCA Solo Signal (Select by VCA Position)
J11-18	VCA Control Level (Select by VCA Position)
J21-28	VCA Mute Signal (Select by VCA Position)

Power Distribution & Link PCB (SC3927)

J1	Matrix Ext. Input L Sensitivity	+4dBu	-10dBu
J2	Matrix Ext. Input R Sensitivity	+4dBu	-10dBu

Output Module LH PCB (SC3921)

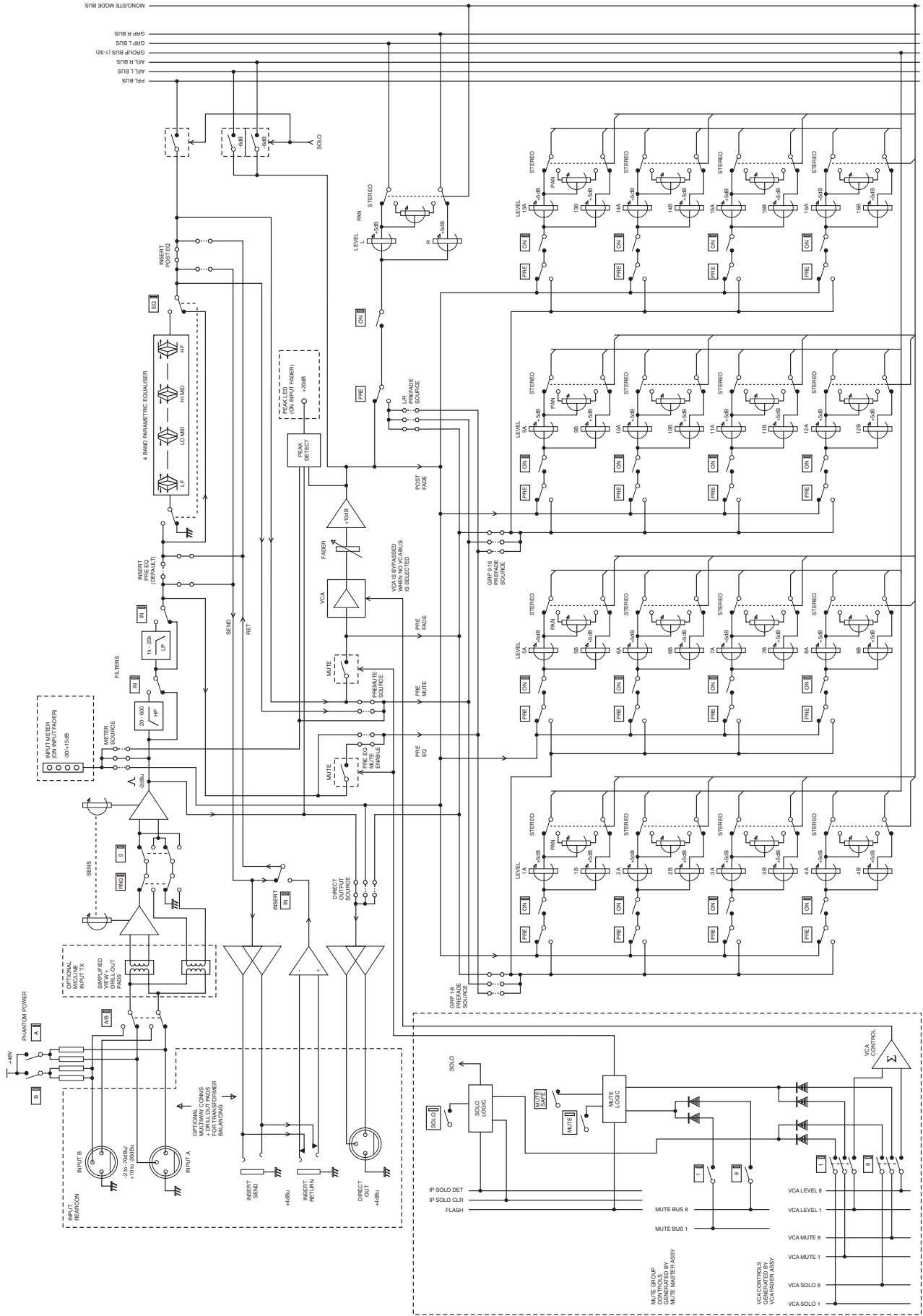
J1-16	"A" Group Input Select (GRPS 1-16)
J17-20	"A" Group Input Select 24 Bus Consoles Only
J21-36	"B" Group Input Select (GRPS 1-16)
J37-68	A+B Group Output Select (GRPS 1-16)
J70	Ground Cancel Bus Select
J71-86	Matrix Output Select
J87-90	Matrix External Input Option Select
J101-116	Mono/Stereo Mode Switch Select

FIVE Monitor

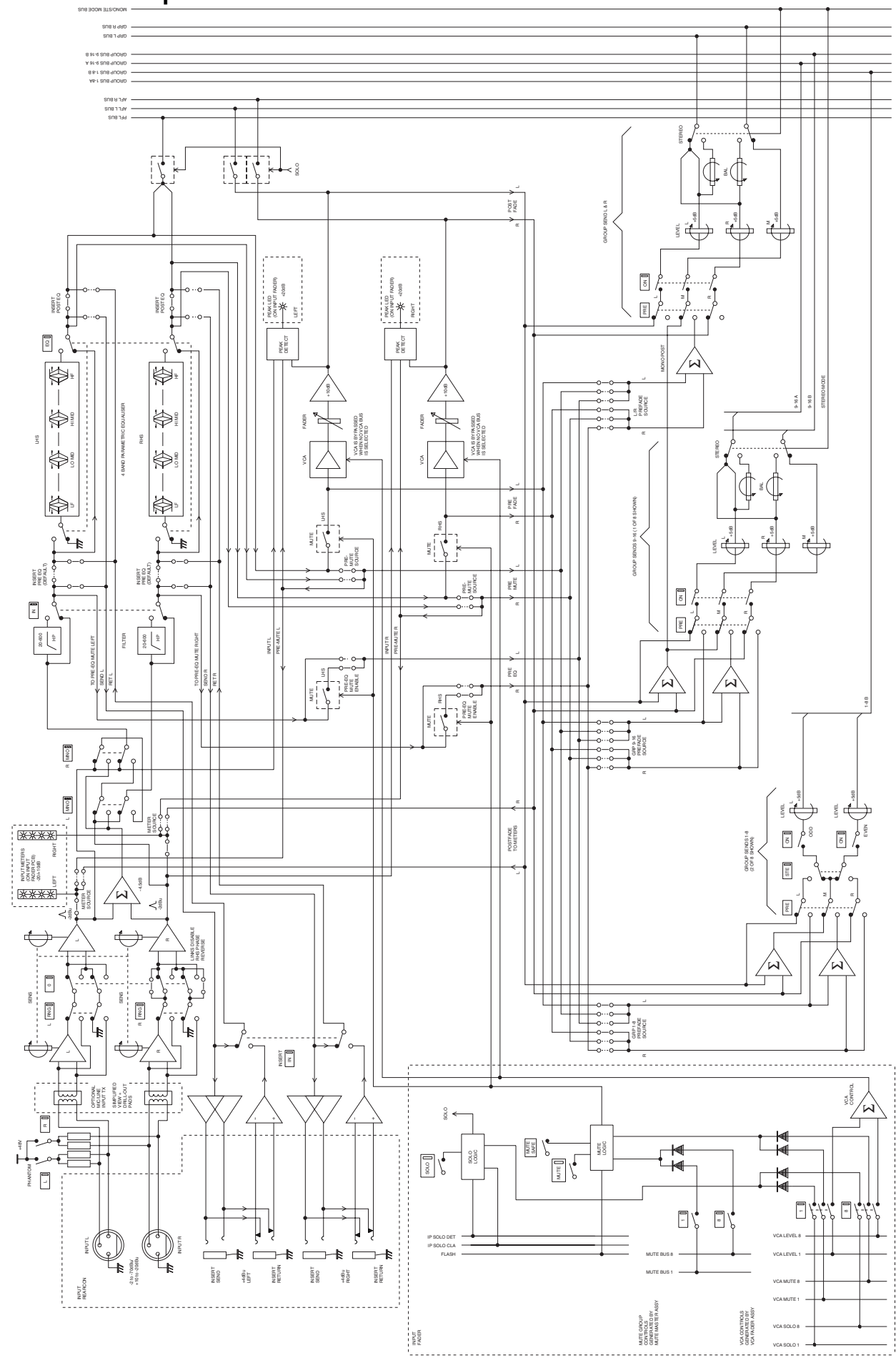
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Block Diagrams

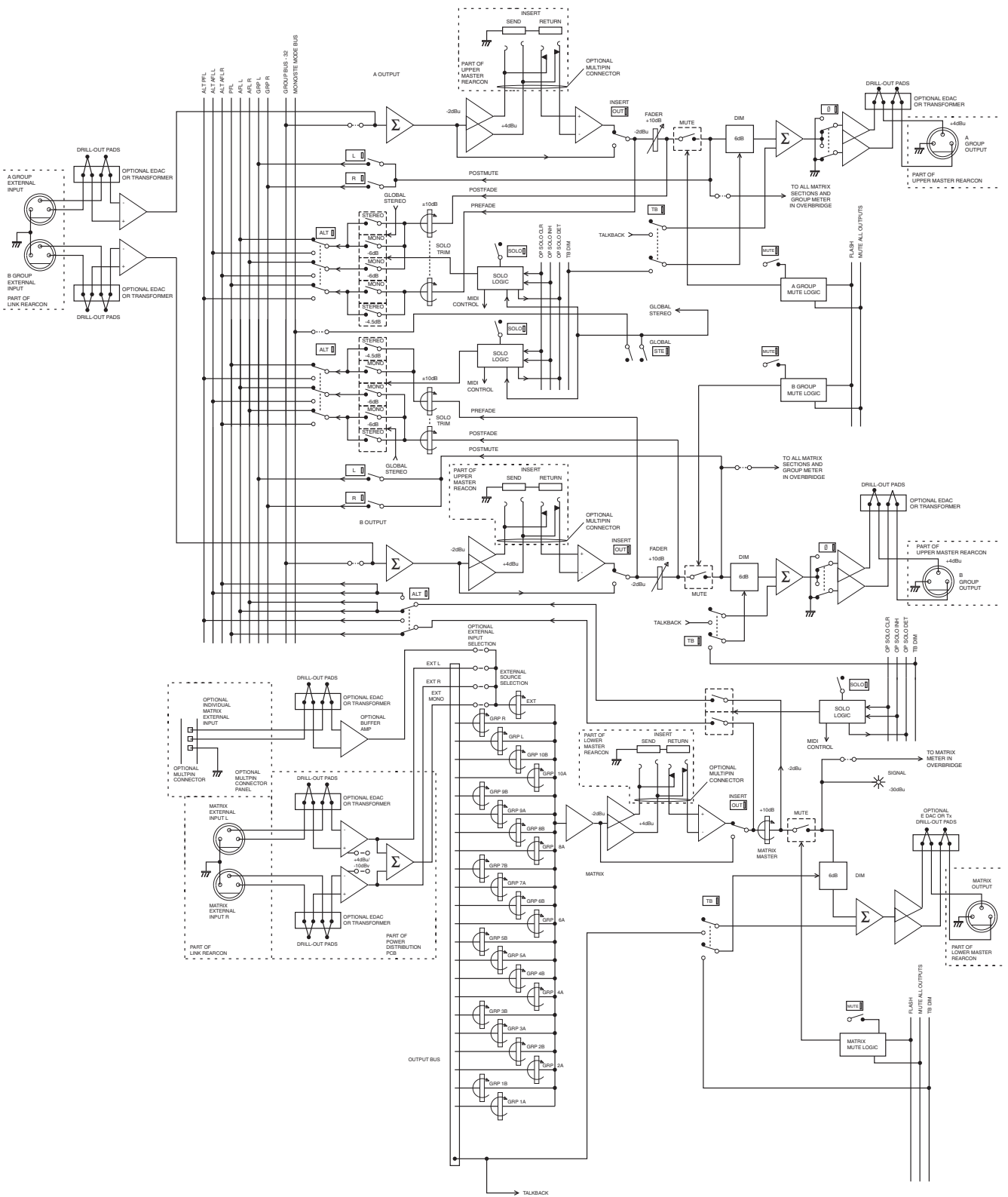
32-Bus Mono Input Module



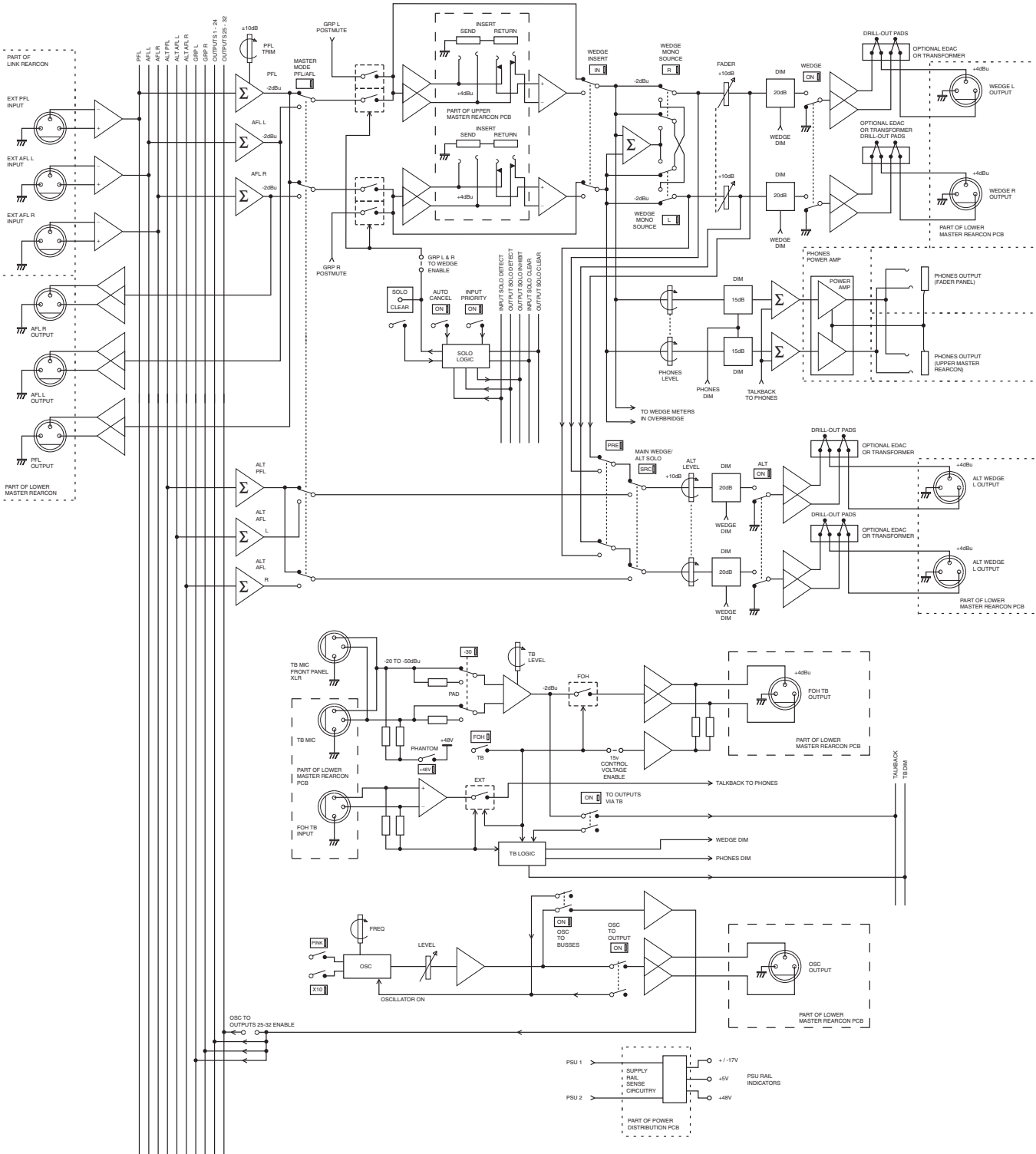
24-Bus Stereo Input Module



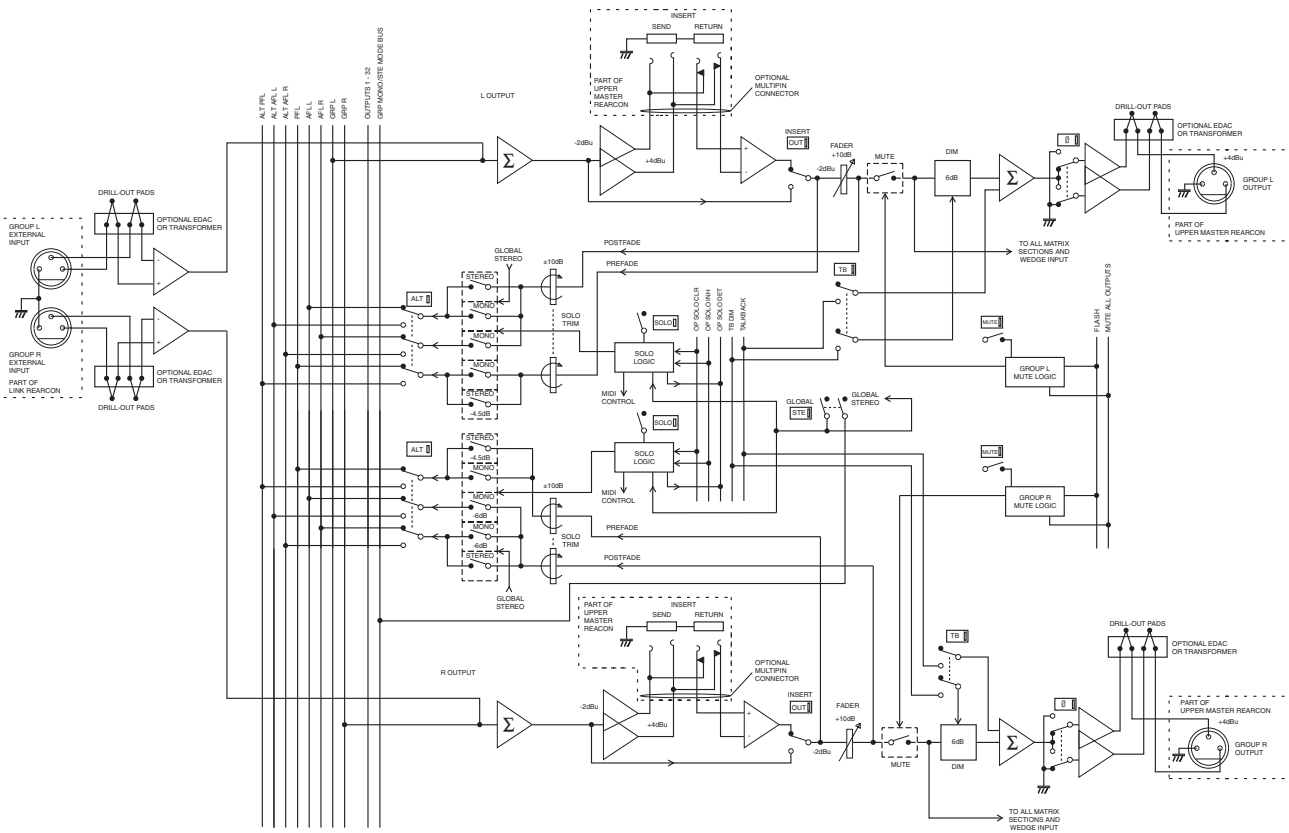
32-Bus Output Module



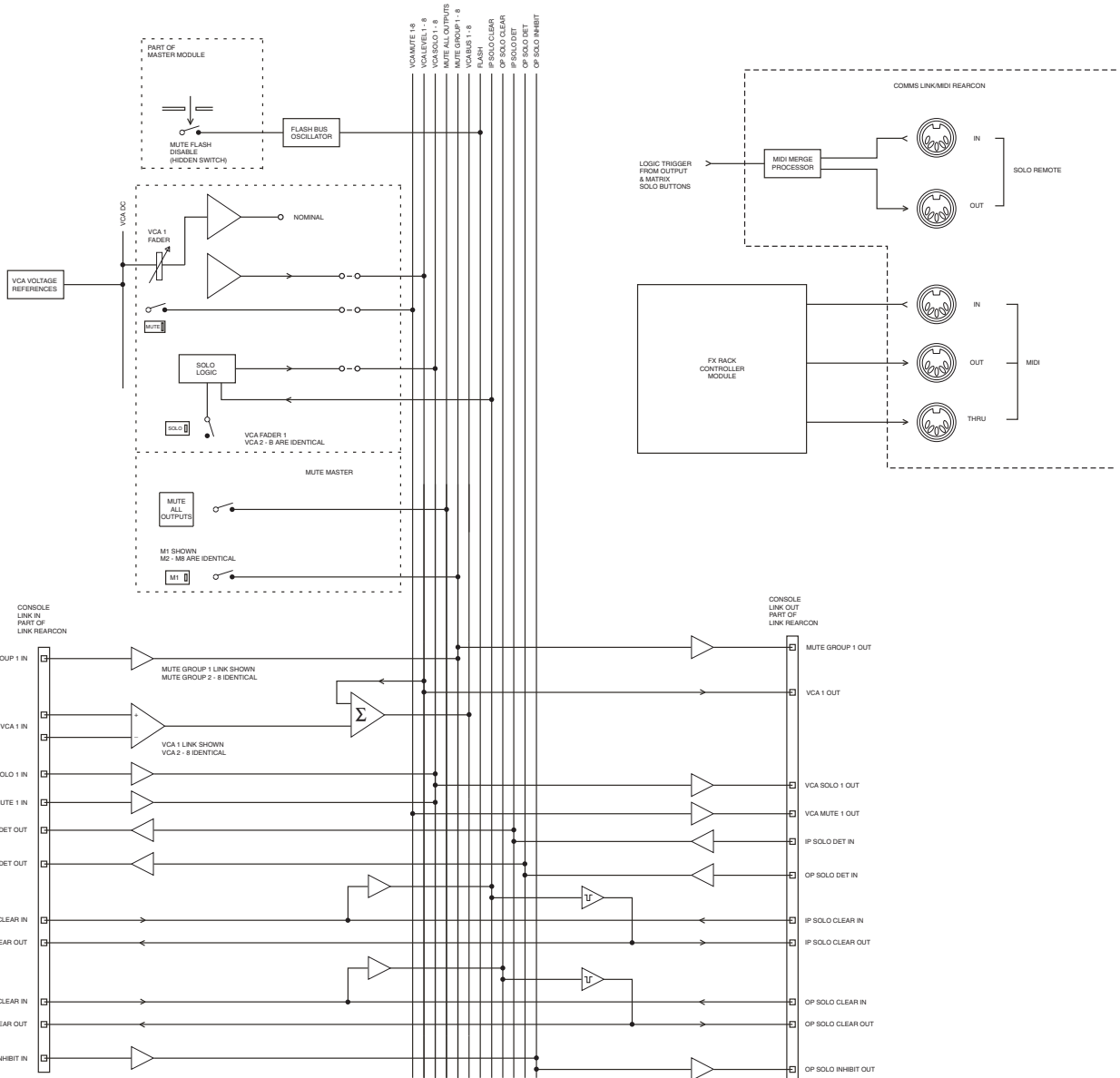
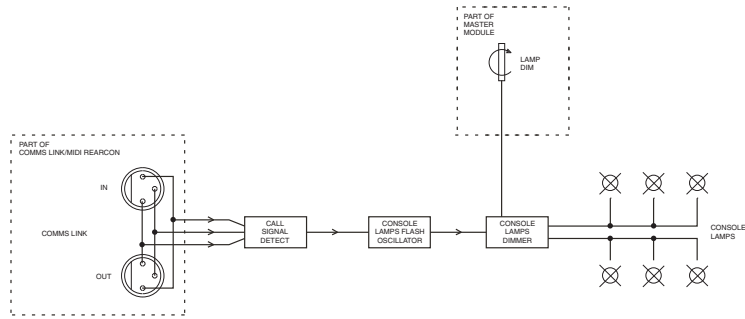
Master Module (I)



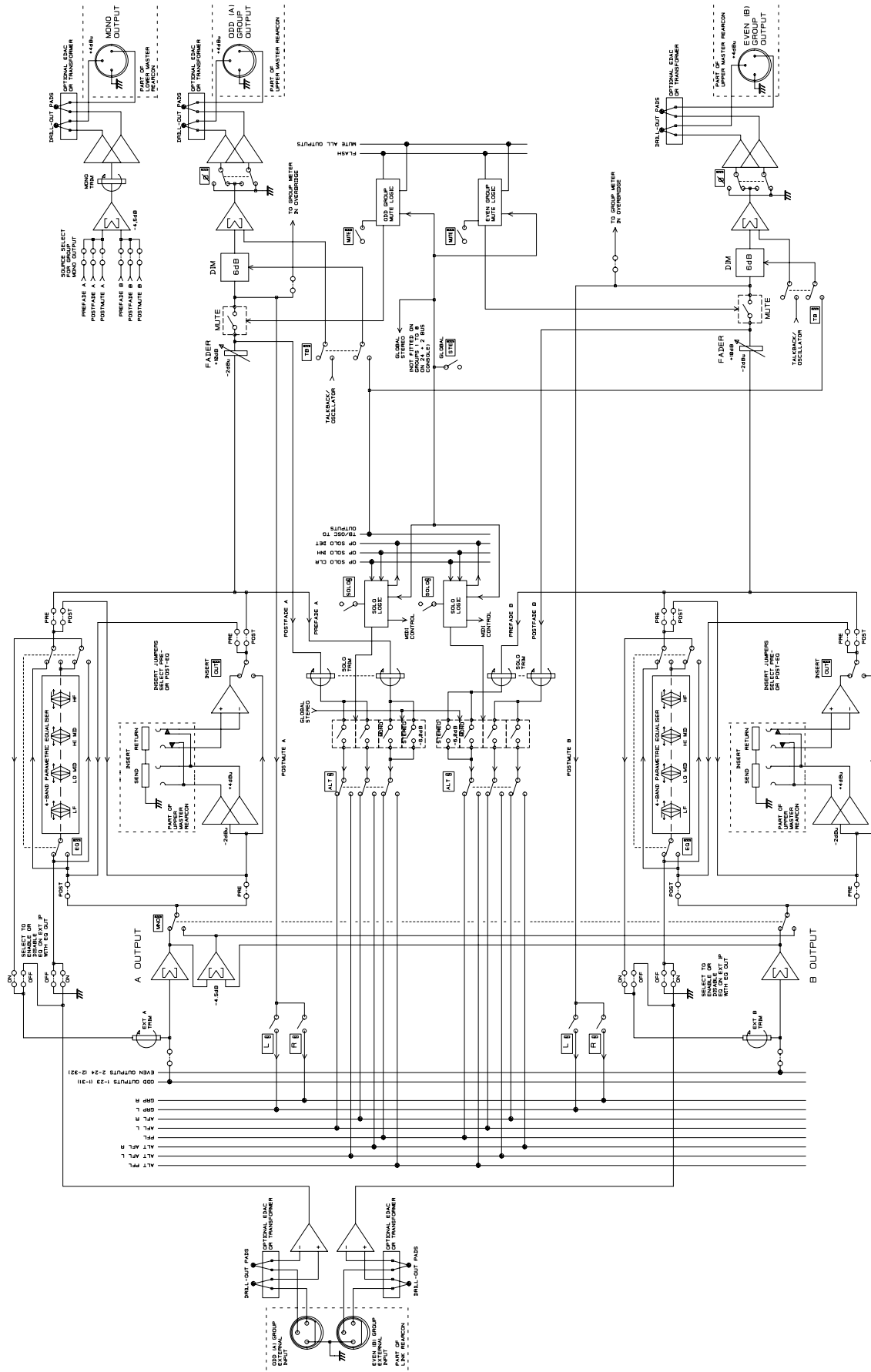
Master Module (2)



Master Module (3)



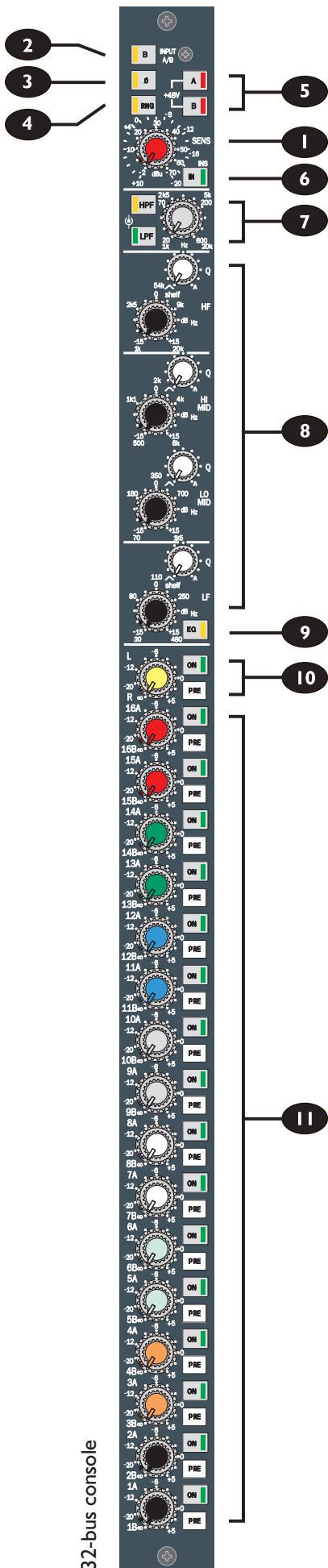
EQ Output



FIVE Monitor

4

Functional Description



HF

The HF section is fully sweepable from 1kHz to 20kHz. Q is variable from 0.5 to 3.0, or the band may be switched to a shelving response by turning the Q control fully anticlockwise.

HMF

The HMF spans the range 500Hz to 8kHz. Q is variable from 0.5 to 3.0.

LMF

The LMF spans the range 70Hz to 1.5kHz. Q is variable from 0.5 to 3.0.

LF

The LF section is fully sweepable from 30Hz to 480Hz. Q is variable from 0.5 to 3.0, or the band may be switched to a shelving response by turning the Q control fully anticlockwise.

9 EQ

The EQ section is active when the EQ switch is pressed, and bypassed when the switch is released, allowing easy A/B comparison of the signal with or without EQ.

10 L/R Monitor Sends

A dual-concentric control routes the signal to the L/R output (on the lower section of the Master Module). The control may either be configured as two mono sends (Left and Right), or, if the Global Mode STE switch on the output section on the Master module is pressed, the send becomes a stereo pair, with the top knob being send level, and the lower knob being a PAN control. The sends are muted unless the ON switch is pressed, and may be switched pre-fader by pressing the PRE switch. The pre-fade source may be configured as pre-fade/post-mute, pre-mute or pre-EQ/pre-insert using internal jumpers. (see chapter 2).

11 Mono/Stereo Monitor Sends

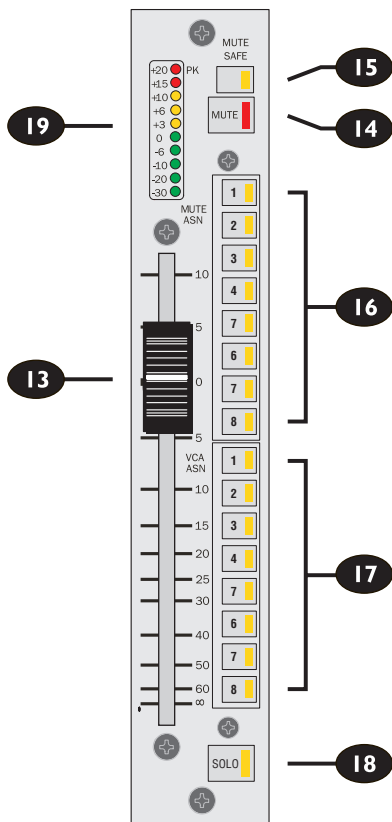
The sends to outputs 9-16 (24-bus consoles) or 1-16 (32-bus consoles) are on dual concentric pots, and each row can be configured at the touch of a button as either a stereo send with level on the top knob and pan on the lower, or a pair of mono sends. These pairs of mixes are controlled by the faders in the output modules, and are labelled 1A & B (8A & B on 24-bus consoles) to 16A and B. Stereo mode is selected by pressing the Global Mode STE button on the respective output module. The sends are muted unless the ON switch is pressed, and may be switched pre-fader by pressing the PRE switch. The pre-fade source for sends 9-16 may be configured as pre-fade/post-mute, pre-mute or pre-EQ/pre-insert using internal jumpers. (see chapter 2).

12 Mono Monitor Sends (24-bus consoles only)

The lower 8 sends on 24-bus consoles are configured as full-time mono sends, using single pots. The output modules for these mixes are similar to the output modules for stereo pairs of outputs, except the Global Mode STE switch is omitted, and the modules comprise two separate output sections. The sends are muted unless the ON switch is pressed, and may be switched pre-fader by pressing the PRE switch. The pre-fade source for sends 1-8 may be configured as pre-fade/post-mute, pre-mute or pre-EQ/pre-insert using internal jumpers. (see chapter 2).

13 Fader

A high-quality 100mm channel fader controls the level to all busses, and has 10dB of gain when full up as well as an expanded scale around the critical unity gain area, for maximum resolution.



14 MUTE

The Channel MUTE switch mutes all feeds from the input channel, and can be remotely controlled by the console's Mute Master section, allowing creation of up to 8 mute groups. The integral LED illuminates when the Mute is active.

15 MUTE SAFE

A semi-recessed Mute SAFE switch allows the channel to be prevented from remote muting by mute groups, but still allows it to be locally muted. Safe mode is selected when the switch is pressed and internally illuminated.

MUTE SAFE is particularly useful for protecting key channels and their associated FX returns from accidental Muting, or for over-riding any remote muting when a problem occurs during a show and conventional manual control is temporarily required.

16 MUTE ASN (Mute Group Assignment)

Each input channel can be assigned to any combination of 8 mute groups, using the recessed switch bank next to the fader. The corresponding Mute Master buttons are located on the Master module.

17 VCA ASN (VCA Group Assignment)

A bank of 8 latching VCA Assign switches with internal LEDs allow the channel to be assigned to any of the eight VCA Groups. Any combination of assignments is possible. When no VCA is assigned, the VCA element itself is switched out of the signal path, to maximise performance. MUTES or SOLOS on the VCA Group Master Faders will activate the MUTE or SOLO respectively on any assigned input channels, allowing groups of inputs to be controlled together with a single button press.

18 SOLO

The SOLO button is conveniently located below the fader, and provides a mono PFL or stereo AFL feed to the engineer's headphones or monitors or triggers a destructive SOLO-IN-PLACE, depending on the mode selection at the Master section. The SOLO button can also be activated remotely from a VCA SOLO button, if the channel is assigned to a VCA Group. Intercancel or additive soloing is possible, with or without Input Priority, and solos can be cleared with a single button press (SOLO CLEAR) at the master section. The integral LED illuminates to indicate that a SOLO is active.

19 LED input metering

The channel is fitted with a 10-segment peak-reading bargraph meter, positioned next to each fader for maximum visibility and giving immediate and graphic indication of incoming (pre-EQ) signals. The top (red) LED in the bar is configured as a Peak LED, and monitors the signal path in three places, (input, pre-Mute and post-fader) giving warning that the signal is exceeding +20dBu. The meter point is jumper-selectable to be post-fader if required (see Chapter 2).

Direct Output

A balanced direct output is available on a male XLR on the rear panel. This is fed from a pre-fade signal which can be jumper selectable to be pre or post-EQ, and pre or post-mute, or may be jumper-selected as post-fade.

Rearcon Panel

The connections on the rearcon panel are as follows:

INPUT A and B XLR

Pin 1	Gnd (Screen)
Pin 2	Hot (In-phase signal)
Pin 3	Cold(Out-of-phase signal)

DIRECT OUT (Balanced)

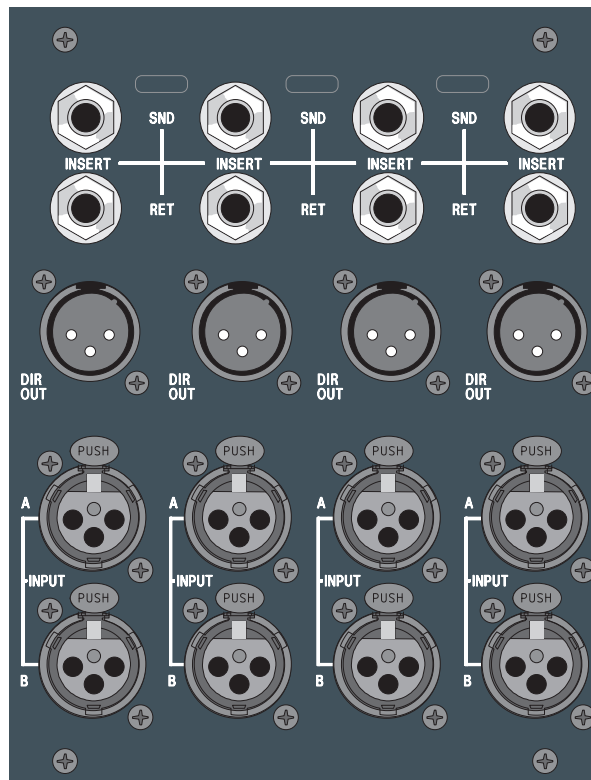
Pin 1	Gnd (Screen)
Pin 2	Hot (In-phase signal)
Pin 3	Cold(Out-of-phase signal)

INSERT SEND (Balanced)

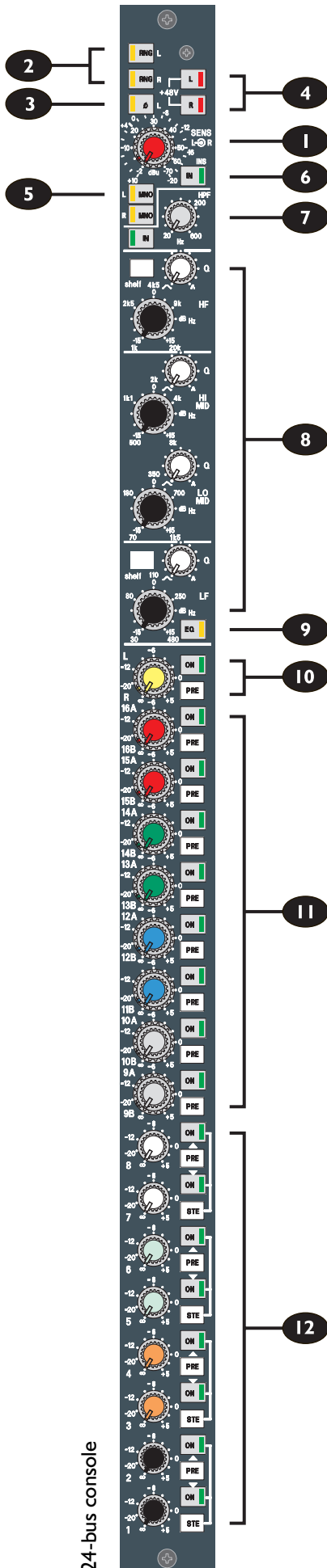
Tip	Hot (In-phase signal)
Ring	Cold (Out-of-phase signal)
Sleeve	Gnd(screen)

INSERT RETURN (Balanced)

Tip	Hot (In-phase signal)
Ring	Cold (Out-of-phase signal)
Sleeve	Gnd(screen)



Optional Stereo Input Module



The optional Stereo module has Left and Right input XLRs and the module may either be configured as a stereo signal path or the Left or Right signals may be fed in mono to both sides of the input.

1 SENS (Sensitivity)

The SENSitivity Control adjusts the level of the signal which is present on the Input XLRs. The input can handle mic or line level signals up to +30dBu, with individual RANGE switches (see below) for L and R selecting high or low sensitivity.

2 RNG (Range) L/R

The RANGE (Range) switches selects between an input range of -2dBu to -70dBu (switch released), and +10dBu to -20dBu (switch pressed and lit), enabling both mic and line level signals to be handled by each side of the input.

CAUTION: Phantom power should not be switched on when unbalanced sources are connected to the XLR inputs.

3 Ø (Phase)

The PHASE switch reverses the phase of the Left input signal when pressed, to compensate for incorrect wiring or mic placement. The switch is internally illuminated when phase is reversed.

4 48V L and R

The 48V switches, when depressed, place 48V phantom power on pins 2 & 3 of the respective Left and Right input XLRs. Integral LEDs illuminate when the phantom power is on.

CAUTION: Phantom power should not be switched on when unbalanced sources are connected to the XLR inputs.

5 MNO (Mono) L and R

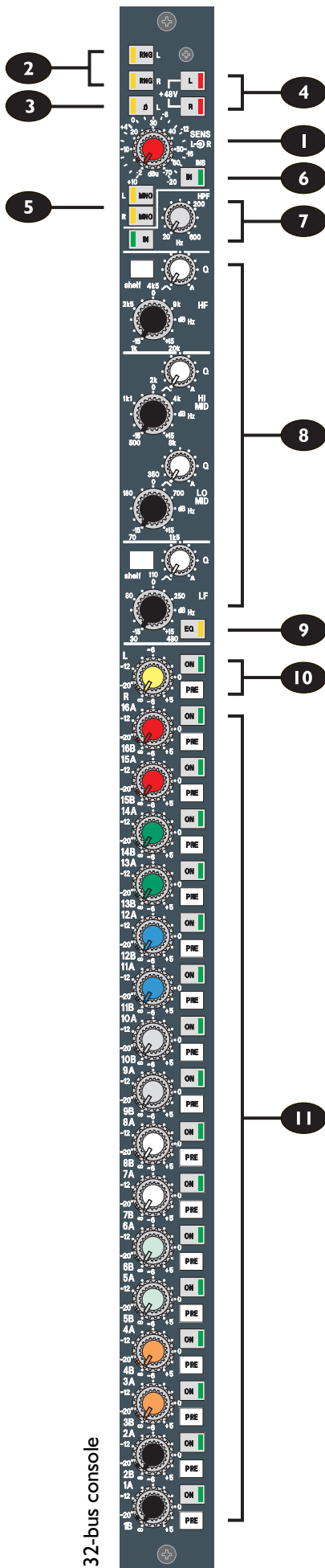
The MNO L and R switches select the Left or Right sides of the source signal (post input amp) and feeds either or both signals to both channels of the module. This is very useful when a single mono source is attached to just one leg of the input, but is required to feed both sides of an Output pair which has been globally configured as Stereo.

6 INS (Insert Point)

The Insert Point may be switched in circuit by the INS switch. The insert uses separate balanced jacks for send and return. It is normally positioned after the filter and before the equaliser, but can be repositioned using internal jumpers to be post-EQ if required. The insert is in-circuit when the switch is illuminated.

7 HPF (Highpass Filter)

A sweepable High-pass Filter (HPF) control sets the cutoff (-3dB) frequency of the High-pass filter: it is adjustable between 20Hz and 600Hz. The filter is active when the IN switch is pressed, and bypassed when the switch is released, allowing easy A/B comparison of the signal with and without the extreme low end content.



8 EQ

The stereo EQ section comprises four fully parametric bands, with adjustable Q. Each section has a dual concentric control providing 15dB boost or cut (upper knob) at a variable frequency (lower knob) and a separate Q control.

HF

The HF section is fully sweepable from 1kHz to 20kHz. Q is variable from 0.5 to 3.0, or the band may be switched to a shelving response by pressing the associated SHELFB switch.

HMF

The HMF spans the range 500Hz to 8kHz. Q is variable from 0.5 to 3.0.

LMF

The LMF spans the range 70Hz to 1.5kHz. Q is variable from 0.5 to 3.0.

LF

The LF section is fully sweepable from 30Hz to 480Hz. Q is variable from 0.5 to 3.0, or the band may be switched to a shelving response by pressing the SHELFB switch.

9 EQ

The EQ section is active when the EQ switch is pressed, and bypassed when the switch is released, allowing easy A/B comparison of the signal with or without EQ.

10 L/R Monitor Sends

A dual-concentric control routes the signal to the L/R output (on the lower section of the Master Module).

The send is globally switched into stereo as on the mono input, but in a slightly different way. In stereo mode, the control works as upper=level, lower=balance, with the left half of the module routed to the L bus and the right half to the R bus. The balance control then gives unity to both sides when in centre, and +4.5dB to one side when fully turned that way, and OFF to the other side.

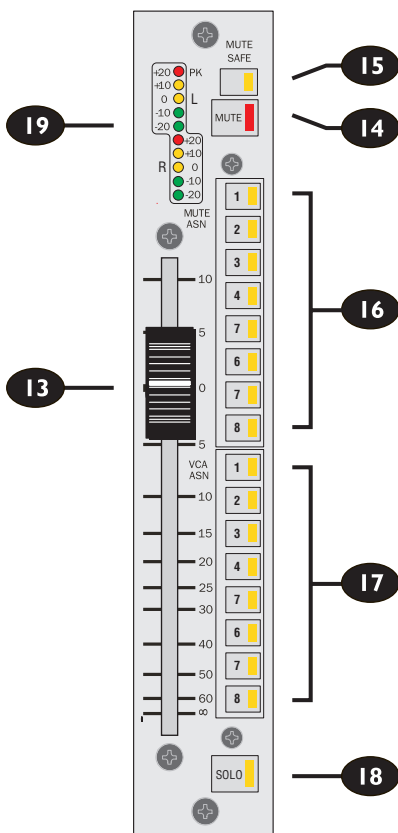
In mono mode, the upper and lower knobs are both level controls, the upper feeding a mono sum (pre or post-fade as selected by the PRE switch) to the L bus and the lower a mono sum to the R bus, with a gain of 5dB at full rotation.

The send is muted unless the ON switch is pressed, and may be switched pre-fader by pressing the PRE switch. The pre-fade source may be configured as pre-fade/post-mute, pre-mute or pre-EQ/pre-insert using internal jumpers. (see chapter 2).

11 Mono/Stereo Monitor Sends

The sends to outputs 9-16 (24-bus consoles) or 1-16 (32-bus consoles) are on dual concentric pots, and each row can be configured at the touch of a button as either a stereo send or a pair of mono sends. In stereo mode, the controls work as upper=level, lower=balance, with the left half of the module routed to the L bus and the right half to the R bus. The balance control then gives unity to both sides when in centre, and +4.5dB to one side when fully turned that way, and OFF to the other side.

In mono mode, the upper and lower knobs are both level controls, the upper feeding a mono sum (pre or post-fade as selected by the PRE switch) to the L bus and the lower a mono sum to the R bus, with a gain of 5dB at full rotation.



These pairs of mixes are controlled by the faders in the output modules, and are labelled 1A & B (8A & B on 24-bus consoles) to 16A and B. Stereo mode is selected by pressing the Global Mode STE button on the respective output module. The sends are muted unless the ON switch is pressed, and may be switched pre-fader by pressing the PRE switch. The pre-fade source for sends 9-16 may be configured as pre-fade/post-mute, pre-mute or pre-EQ/pre-insert using internal jumpers. (see chapter 2).

12 Mono Monitor Sends (24-bus consoles only)

The lower 8 sends on 24-bus consoles are configured as either individual sends, each fed with a mono sum of the stereo signal, or (by pressing the STE switch) as stereo pairs, with odd numbers feeding the L busses and even numbers feeding the R busses. This switching is done in four blocks of two sends, i.e. there is a STE switch for every pair of mono sends. The PRE switches also affect adjacent pairs of sends.

The output modules for these mixes are similar to the output modules for stereo pairs of outputs, except the Global Mode STE switch is omitted, and the modules comprise two separate output sections. The sends are muted unless the ON switch is pressed, and may be switched pre-fader by pressing the PRE switch. The pre-fade source for sends 1-8 may be configured as pre-fade/post-mute, pre-mute or pre-EQ/pre-insert using internal jumpers. (see chapter 2).

13 Fader

A high-quality 100mm channel fader controls the level to all busses, and has 10dB of gain when full up as well as an expanded scale around the critical unity gain area, for maximum resolution.

14 MUTE

The Channel MUTE switch mutes all feeds from the input channel, and can be remotely controlled by the console's Mute Master section, allowing creation of up to 8 mute groups. The integral LED illuminates when the Mute is active.

15 MUTE SAFE

A semi-recessed Mute SAFE switch allows the channel to be prevented from remote muting by mute groups, but still allows it to be locally muted. Safe mode is selected when the switch is pressed and internally illuminated. MUTE SAFE is particularly useful for protecting key channels and their associated FX returns from accidental Muting, or for over-riding any remote muting when a problem occurs during a show and conventional manual control is temporarily required.

16 MUTE ASN (Mute Group Assignment)

Each input channel can be assigned to any combination of 8 mute groups, using the recessed switch bank next to the fader. The corresponding Mute Master buttons are located on the Master module.

17 VCA ASN (VCA Group Assignment)

A bank of 8 latching VCA Assign switches with internal LEDs allow the channel to be assigned to any of the eight VCA Groups. Any combination of assignments is possible. When no VCA is assigned, the VCA element itself is switched out of the signal path, to maximise performance. MUTES or SOLOS on the VCA Group Master Faders will activate the MUTE or SOLO respectively on any assigned input channels, allowing groups of inputs to be controlled together with a single button press.

18 SOLO

The SOLO button is conveniently located below the fader, and provides a mono PFL or stereo AFL feed to the engineer's headphones or monitors depending on the mode selection at the Master section. The SOLO button can also be activated remotely from a VCA SOLO button, if the channel is assigned to a VCA Group. Intercancel or additive soloing is possible, with or without Input Priority, and solos can be cleared with a single button press (SOLO CLEAR) at the master section. The integral LED illuminates to indicate that a SOLO is active.

19 LED input metering

The channel is fitted with a dual 5-segment peak-reading bargraph meter, positioned next to each fader for maximum visibility and giving immediate and graphic indication of incoming (pre-EQ) signals. The top (red) LED in the bar is configured as a Peak LED, and monitors the signal path in three places, (input, pre-Mute and post-fader) giving warning that the signal is exceeding +20dBu. The meter point is jumper-selectable to be post-fader if required (see Chapter 2).

Rearcon Panel

The connections on the rearcon panel are as follows:

INPUT L and R XLR

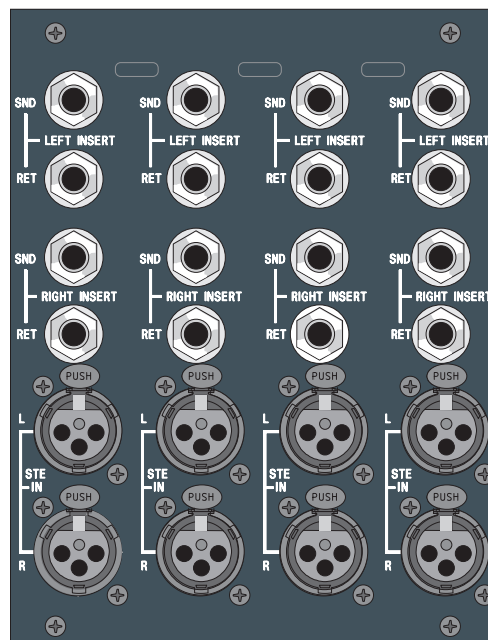
Pin 1	Gnd (Screen)
Pin 2	Hot (In-phase signal)
Pin 3	Cold (Out-of-phase signal)

INSERT SEND (Balanced)

Tip	Hot (In-phase signal)
Ring	Cold (Out-of-phase signal)
Sleeve	Gnd(screen)

INSERT RETURN (Balanced)

Tip	Hot (In-phase signal)
Ring	Cold (Out-of-phase signal)
Sleeve	Gnd(screen)



Output Module

The standard Output sections of the 24 and 32 bus frame sizes are very similar, and differ only in the omission of one switch and Matrix labelling.

An alternative version of the Output Module is available which offers a full 4-band parametric EQ (see Input module for description) on each output, instead of the Matrix section. This module can be used to reduce the amount of external EQ required, particularly for in-ear monitoring applications. The redundant Matrix Output XLR is used for a mono sum of the A and B outputs, which is useful for feeding an on-stage sub-woofer.

MATRIX OUTPUTS

The Matrices are controlled via the upper section of the Output modules - one matrix per module, hence 12-Output matrix on the 24-bus version, and 16-Output matrix on the 32-bus version. An External Input, L/R bus, and the first 10 pairs of Output busses are available as contributions into the matrix via the 11 dual-concentric and single mono pots.

1 EXT IN

The EXT IN level control adjusts the level of a stereo External Input which can be mixed to each matrix. The External input Left and Right signals are shared by all matrix sections in the console and are electronically balanced.

The signal is fed one of two ways to the EXT receive controls on the matrix sections: either a mono sum of the left and right external inputs is fed to each receive pot, or the left input is fed to all odd numbered matrix Outputs, and the right input to all even matrix Outputs. The type of feed to each receive pot is set by internal jumpers.

2 GROUPS MIX TO MATRIX

11 dual-concentric controls mix the Group output signals to the matrix. The Group assignment is different between the 24-bus and the 32-bus consoles and is arranged as follows:

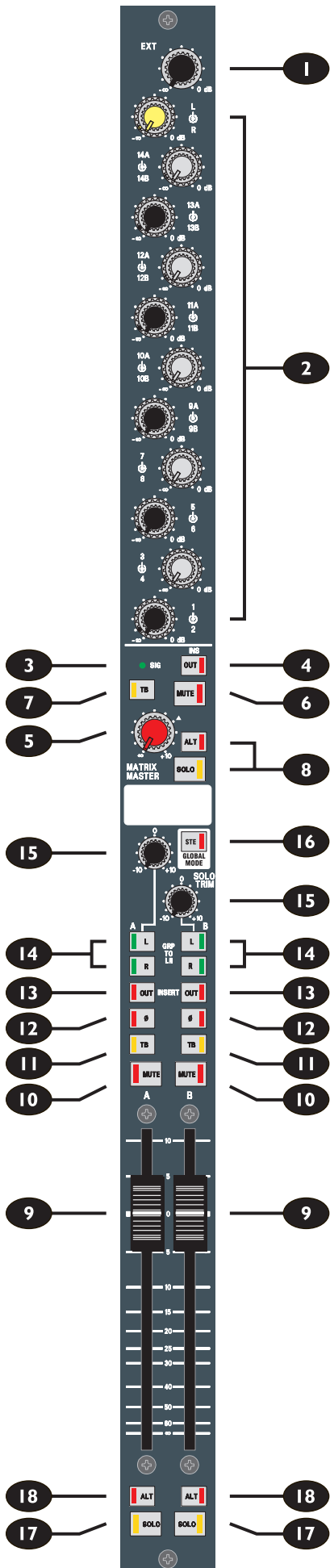
24-bus version	32-bus version
Group Outputs 1/2	1A/1B
Group Outputs 3/4	2A/2B
Group Outputs 5/6	3A/3B
Group Outputs 7/8	4A/4B
Group Outputs 9A/B	5A/5B
Group Outputs 10A/B	6A/6B
Group Outputs 11A/B	7A/7B
Group Outputs 12A/B	8A/8B
Group Outputs 13A/B	9A/9B
Group Outputs 14A/B	10A/10B
Group Outputs L/R	L/R
Ext Input	Ext Input

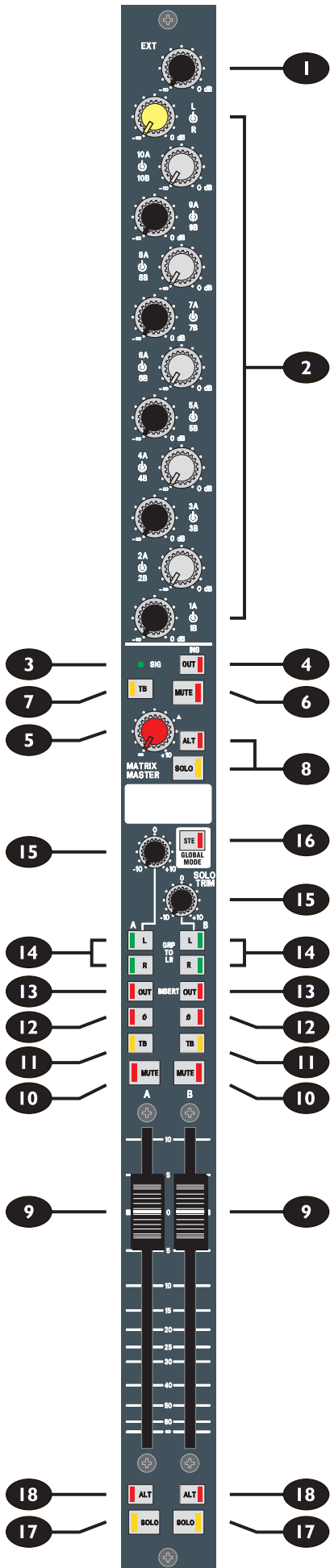
3 SIG LED

The SIG LED shows post-fade signal present, illuminating when -30dB is passing through the Matrix path.

4 INS (OUT)

The Insert Point consists of separate Send and Return jacks on the rear panel. The Send is normalled to the Return. The OUT switch bypasses the Insert Point when pressed, but leaves the pre-fade output signal on the Send jack to feed external equipment if required. The switch is illuminated when the insert is bypassed.





5 MATRIX MASTER

This control sets the master level for the Matrix and provides 10dB of gain when fully clockwise.

6 MUTE

The Matrix output is muted when the switch is pressed, and the integral LED illuminates to show that the MUTE is active. Note that TALKBACK may still be sent to that output (if TB is pressed), as it is injected post-mute.

7 TB

Pressing the latching TB switch arms the Matrix output to receive talkback from the central talkback section on the Master, when the master "TO OUTPUTS VIA TB" INT switch is active. The switch illuminates to warn that TB is armed. The output is dimmed by 6dB when talkback is active. Alternatively, if the Master Talkback signal is already active, pressing TB routes the Talkback signal to the output, until the switch is released.

8 SOLO

The SOLO switch routes the signal from the associated Matrix to the mono PFL or stereo AFL busses of the desk, as defined in the Master SOLO mode. The feed to the AFL bus is post-fade but pre-MUTE, allowing AFL SOLOing of MUTED Matrix Outputs.

9 ALT (SOLO)

The ALT switch sets the Matrix Output to feed the ALT SOLO busses instead of the primary SOLO busses. The operator can now switch between two SOLO Output systems when a secondary monitoring system is in use (e.g. Primary is Wedge, Secondary is In-Ear).

INSERT

A balanced Insert Point is provided, consisting of separate Send and Return jacks on the rear panel. The Send is normalled to the Return.

GROUP OUTPUTS

The module comprises two identical Output sections which may be used individually or linked as a stereo pair.

9 FADER

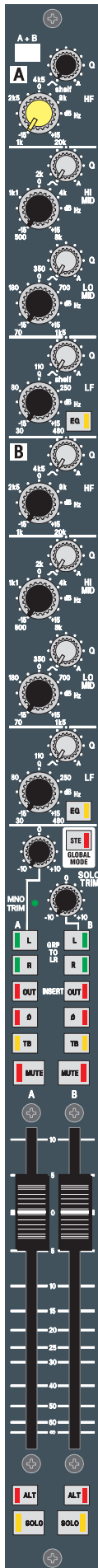
The 100mm fader controls the final level to the electronically balanced output.

10 MUTE

The output is muted when the switch is pressed, and the integral LED illuminates to show that the MUTE is active.

11 TB

Pressing the latching TB switch arms the output to receive talkback from the central talkback section on the Master, when the master "TO OUTPUTS VIA TB" INT switch is active. The switch illuminates to warn that TB is armed. The output is dimmed by 6dB when talkback is active. Alternatively, if the Master Talkback signal is already active, pressing TB routes the Talkback signal to the output, until the switch is released. TB is injected post the meter takeoff point, so talkback signals do not appear on the meterbridge.



12 Ø (Phase)

Pressing the Ø (Phase) switch reverses the phase of the output, to allow experimentation for best feedback immunity with a multiple-mic setup. The switch is illuminated when the phase is reversed.

13 INSERT (OUT)

The Insert Point consists of separate Send and Return jacks on the rear panel. The Send is normalled to the Return.

The OUT switch bypasses the Insert Point when pressed, but leaves the pre-fade output signal on the Send jack to feed external equipment if required. The switch is illuminated when the insert is bypassed.

14 GRP TO L/R

The internally illuminated L and R switches route the post-mute, post-fade output signal to the last pair of output busses (designated L and R) for subgrouping. This allows the FIVE Monitor to be used as a Front-of-House mixer if necessary, summing the Groups for a pair of stage fills, or perhaps giving a simple and quick method for the Monitor Engineer to make a 2-track recording of certain channels for later reference.

15 SOLO TRIM

SOLO TRIM gives +/- 10dB adjustment to the signal sent from that Output to the AFL/PFL bus. This is useful for trimming a number of Outputs of varying levels to give a consistent monitor level, thus reducing the requirement for manual Wedge or ALT master adjustments whenever a SOLO is selected.

16 GLOBAL MODE (STE)

The GLOBAL MODE STE switch (not present on Output modules 1-4 of a 24-bus FIVE Monitor which are mono only) provides switching of the associated pairs of send controls on the input channels between MONO and STEREO operation. In STEREO mode, the SOLO switches on the two Outputs are linked in software, so that pressing one automatically activates the other. See SOLO below for information on how this switch affects the sends to the SOLO busses.

17 & 18 SOLO / ALT

The SOLO switch feeds the pre and post-fade Group signal to one of two sets of PFL and stereo AFL busses: Main or Alternate, depending on the setting of the mechanically latching ALT switch 18. The PFL / AFL state of the SOLO is affected by the global PFL/AFL mode switch on the Master module. The PFL feed is post-INSERT.

The function of the Output SOLO switch is also affected by the GLOBAL MODE (STE) switch. If the mode is mono, each Output SOLO button switches an equal feed at unity gain to each of the AFL left and right busses, and a PFL signal to the PFL bus. If the mode is stereo, the odd and even SOLO switches are logic linked as a pair and the feed is changed to odd Group AFL to left AFL bus, even to right, at unity gain. The PFL feed remains mono.

The SOLO switches can also remotely control a BSS Varicurve™ system - see page 4.20 for details.

METERING

The FIVE Monitor is fitted with two banks of VU Meters for all Group outputs, with switching of the lower bank to display Matrix outputs if required. Two large VUs read the Left and Right outputs.

Rearcon Panels

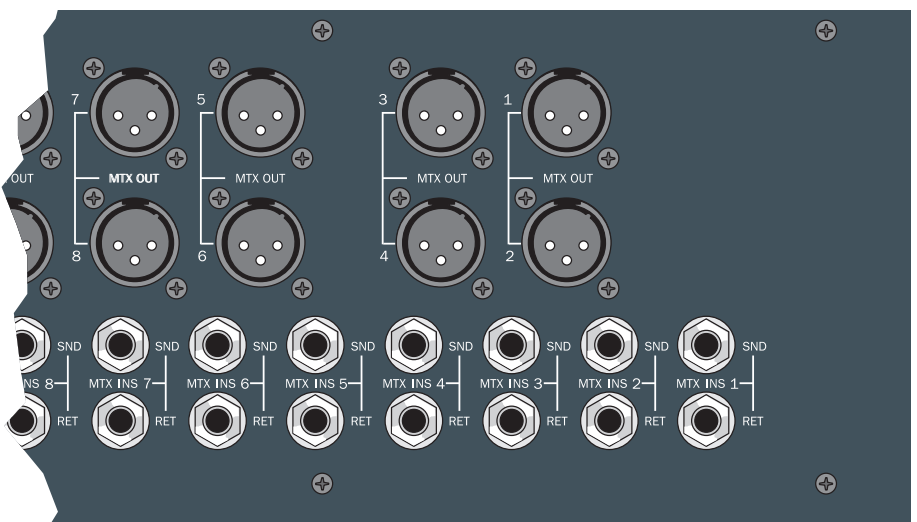
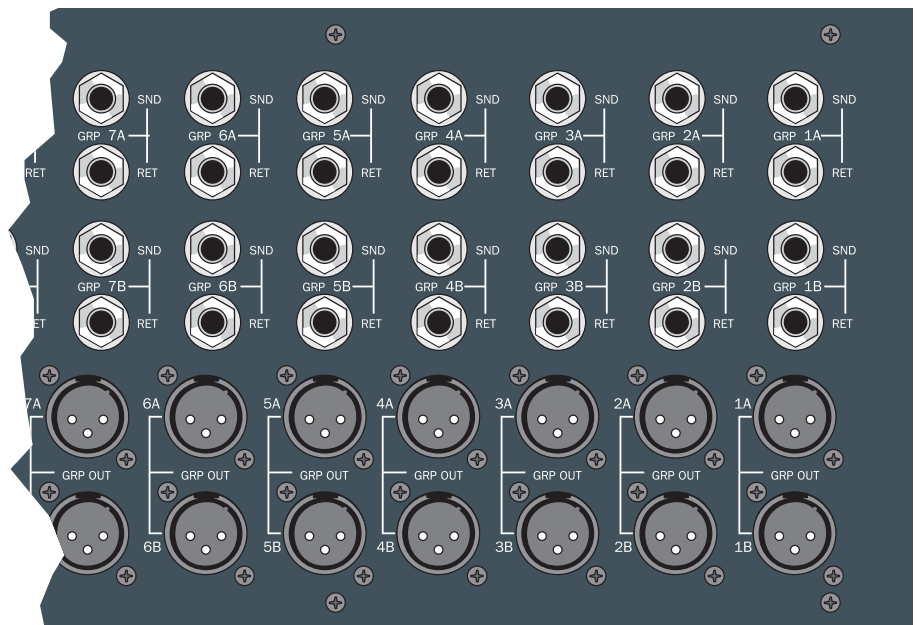
The connections on the rearcon panes are as follows:

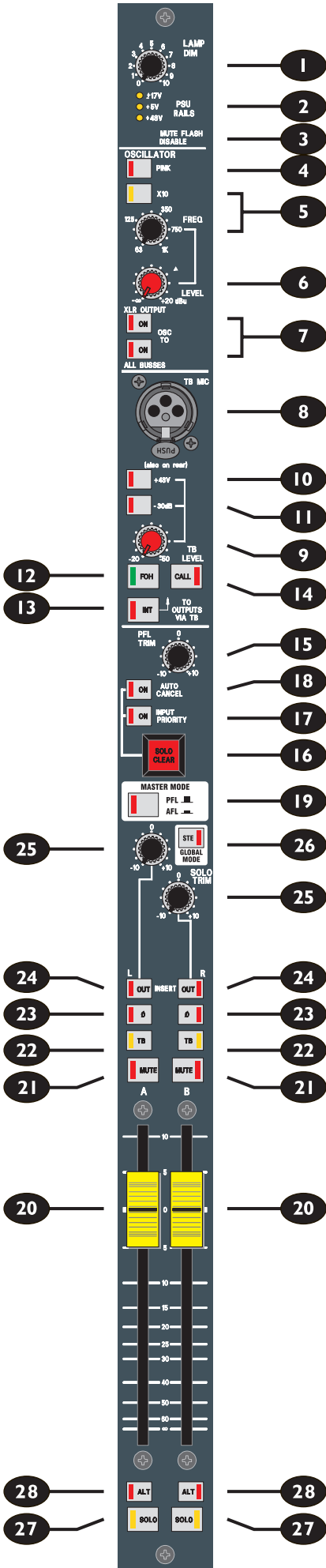
All Output XLRs (balanced)

Pin 1	Gnd (Screen)
Pin 2	Hot (In-phase signal)
Pin 3	Cold (Out-of-phase signal)

INSERT SEND & RETURN (balanced)

Tip	Hot (In-phase signal)
Ring	Cold (Out-of-phase signal)
Sleeve	Gnd(screen)





Master Module

1 LAMP DIMMER

The Lamp Dimmer controls the voltage to the 4-pin XLR socket which is provided for the connection of Littlites™.

The pinout is as follows:

- Pin 1 & 3 +/-12V
- Pin 4 0v
- max. current 400mA

2 PSU RAILS

Three LEDs monitor the status of the power supply rails.

3 MUTE FLASH DISABLE

When an input channel MUTE is triggered by the MUTE switch of either a VCA Master or a MUTE master, it will flash to show that it is under the control of a remote trigger. This flashing may be disabled with the MUTE FLASH DISABLE switch (which is recessed to avoid accidental selection).

OSCILLATOR SECTION

The oscillator generates either tone or pink noise, and has its own independent balanced XLR output on the rear panel. The oscillator can be routed to all busses simultaneously.

4 PINK

The oscillator generates either TONE (switch released), or pink noise (switch pressed and illuminated).

5 FREQ / X10

The frequency range of the oscillator is variable from 63Hz to 1kHz. Pressing the x10 switch (internal LED lit) provides a higher range of 630Hz to 10kHz.

6 LEVEL

This control adjusts the oscillator level to both the XLR output and the internal busses.

7 OSC TO XLR OUTPUT / ALL BUSSES

The rear panel OSC OUT XLR is enabled when the OSC TO (XLR OUTPUT) ON switch is pressed. The internal illumination indicates when the output is active.

The Oscillator may also be routed directly to all busses simultaneously by pressing the OSC TO (ALL BUSSES) ON switch (LED illuminated) where it mixes with any existing signal.

TALKBACK SECTION

The TALKBACK system allows communication by the operator to the Group and Matrix Outputs, and to and from the front of house (FOH) console.

8 TALKBACK MIC

Talkback Mic input XLRs are provided on the front and rear panel.

9 LEVEL

This control adjusts the gain of the Talkback Mic preamp over a 30dB range.

10 +48V

The +48V switch applies phantom power to the Talkback mic input XLRs when pressed.

11 -30dB

The -30dB switch inserts a 30dB pad in the input for use with high level signals or external test generators.

12 FOH

The FOH button (momentary/latching, green LED) initiates talkback to the front of house console using either the Soundcraft proprietary “Blythphone” system, or a Clear-Com™ compatible intercom system. With the latter, an incoming CALL signal is displayed by the console lamps flashing, and pressing the FOH button will then allow 2-way communication, with incoming Talkback appearing on the console headphone Output, dimming the existing signal by 15dB, and dimming the wedge Output by 20dB.

13 TO OUTPUTS VIA TB (INT)

Pressing TO OUTPUTS VIA TB (INT) routes the talkback signal internally to any outputs (Group or Matrix) which have been previously armed for talkback (local TB switch ON). If the switch is pressed momentarily, the switch latches. Alternatively, pressing and holding the switch for more than about one second produces a momentary action until the switch is released. The switch illuminates to warn that TB is active. This action also dims the wedge Output by 20dB.

14 CALL

Pressing the momentary CALL switch sends a CALL signal to the intercom loop. Talkback communication may then be activated by pressing FOH (see above).

PFL / AFL SECTION

.....

15 PFL TRIM

The PFL trim control gives +/-10dB of level adjustment to the input solo level heard in the Wedge and Phones outputs. The output AFL solos have their own individual trim controls on their respective output modules.

16 SOLO CLEAR

Pressing SOLO CLEAR cancels any solos on the console.

17 INPUT PRIORITY

The INPUT PRIORITY (ON) switch, when selected, allows an input solo to temporarily override any output solo which may be present. When the input solo is released, the original output solo will reappear on the monitors. If AUTOCANCEL (see below) is also ON, input solos still have priority, but input solos will only cancel other input solos, and output solos will only cancel other output solos.

18 AUTO CANCEL

The AUTOCANCEL (ON) button, when selected, allows any solo button selected to cancel the previous solo, so that only one SOLO can be active at once. With the switch released, SOLOs are additive.

19 MASTER MODE (PFL / AFL)

The global PFL/AFL mode for the console is set by this switch, as either PFL (switch released) or AFL (switch pressed).

L & R OUTPUT SECTION

The lower half of the Master module comprises the Left/Right Output, which may be used as two individual outputs or linked as a stereo pair.

20 FADER

The 100mm fader controls the final level to the electronically balanced output.

21 MUTE

The output is muted when the switch is pressed, and the integral LED illuminates to show that the MUTE is active.

22 TB

Pressing the latching TB switch arms the output to receive talkback from the central talkback section, when the master "TO OUTPUTS VIA TB" INT switch is active. The switch illuminates to warn that OSC is armed. The output is dimmed by 6dB when talkback is active. Alternatively, if the Master Talkback signal is already active, pressing TB routes the Talkback signal to the output, until the switch is released. TB is injected post the meter takeoff point, so talkback signals do not appear on the meterbridge.

23 Ø (Phase)

Pressing the Ø (Phase) switch reverses the phase of the output, to allow experimentation for best feedback immunity with a multiple-mic setup. The switch is illuminated when the phase is reversed.

24 INSERT (OUT)

The Insert Point consists of separate Send and Return jacks on the rear panel. The Send is normalled to the Return.

The OUT switch bypasses the Insert Point when pressed, but leaves the pre-fade output signal on the Send jack to feed external equipment if required. The switch is illuminated when the insert is bypassed.

25 SOLO TRIM

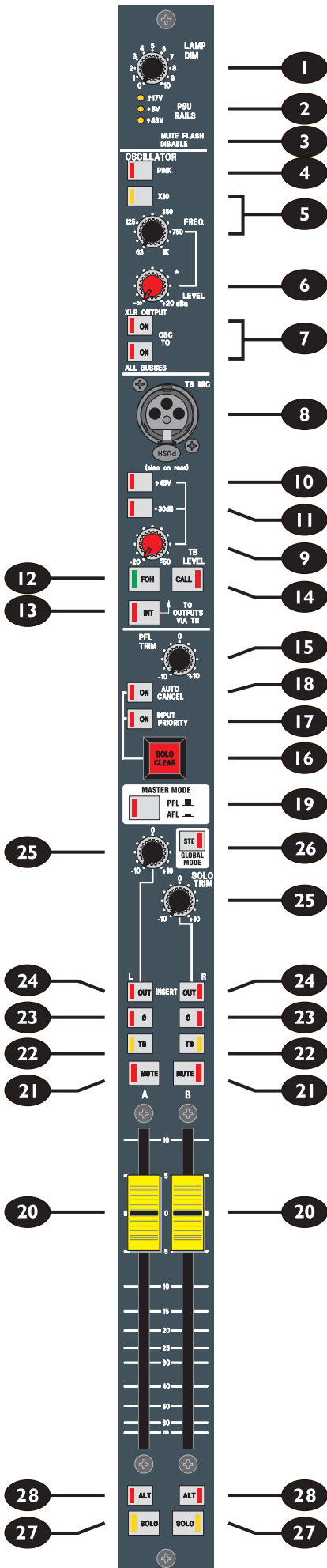
SOLO TRIM gives +/- 10dB adjustment to the signal sent from that Output to the AFL/PFL bus. This is useful for trimming a number of Outputs of varying levels to give a consistent monitor level, thus reducing the requirement for manual Wedge or ALT master adjustments whenever a SOLO is selected.

26 GLOBAL MODE (STE)

The GLOBAL MODE STE switch provides switching of the associated pairs of send controls on the input channels between MONO and STEREO operation. In STEREO mode, the SOLO switches on the L/R Outputs are linked in software, so that pressing one automatically activates the other. See SOLO below for information on how this switch affects the sends to the SOLO busses.

27 & 28 SOLO / ALT

The SOLO switch feeds the pre and post-fade Group signal to one of two sets of PFL and stereo AFL busses: Main or Alternate, depending on the setting of the mechanically latching ALT switch **28**. The PFL / AFL state of the SOLO is affected by the global PFL/AFL mode switch (see above). The PFL feed is post-INSERT.



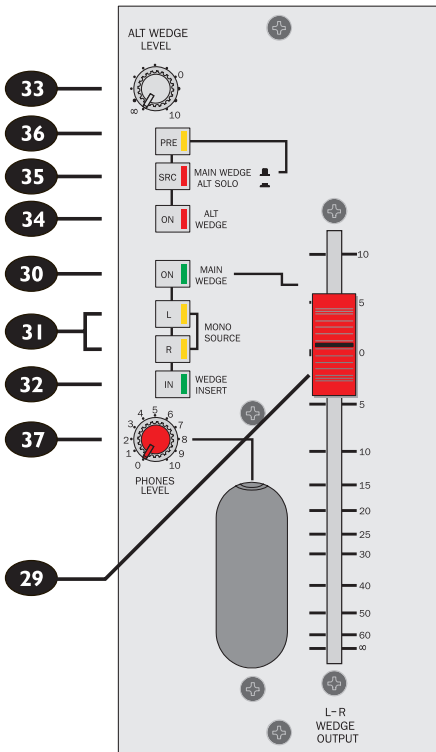
The function of the Output SOLO switch is also affected by the GLOBAL MODE (STE) switch. If the mode is mono, each Output SOLO button switches an equal feed at unity gain to each of the AFL left and right busses, and a PFL signal to the PFL bus. If the mode is stereo, the SOLO switches are logic linked as a pair and the AFL feed is changed to stereo, at unity gain. The PFL feed remains mono.

The SOLO switches can also remotely control a BSS Varicurve™ system - see page 4.20 for details.

EXTERNAL PFL/AFL

Additional PFL, AFL left and AFL right external inputs, from XLRs on the rearcon, allow SOLO signals from another console to be added to the Main PFL and AFL busses. The external PFL level is trimmed by the PFL TRIM pot (see above). When no solos are active on the console, both PFL and AFL left and right external signals are monitored by the Headphones and Wedge. The facility would be used when linking another console as a slave to the FIVE Monitor.

WEDGE OUTPUT



29 WEDGE FADER

A stereo 100mm fader is provided for engineer's Wedge speakers, and this normally receives the EXT SOLO signal (i.e. no signal, unless another slave console is connected.) Whenever an input or output SOLO button is pressed, the Wedge output switches to the corresponding internal or external PFL or AFL signal. An internal jumper allows the output to be configured to receive the Left/Right output instead of EXT SOLO, unless an internal SOLO is active. The Fader also controls the overall level of the ALT WEDGE outputs if these are configured to follow the Main Wedge (see SRC below).

30 MAIN WEDGE ON

The Main Wedge is enabled when the switch is pressed. Note that the ALT WEDGE output is unaffected, even if configured to follow the Main Wedge (see SRC below).

31 MONO SOURCE L/R

MONO SOURCE buttons L and R allow either the Left or Right output/solo signals to be fed in mono to both Left and Right Wedge outputs without a gain change, or if both are pressed, the output will be a mono sum of Left and Right. This MONO SOURCE function is useful when handling stereo AFL signals on a single monitor wedge.

32 WEDGE INSERT (IN)

The Wedge Insert Point is normally bypassed, unless the IN switch is pressed, and is before the Mono Source switching and the feed to the ALT WEDGE, so that both Wedge outputs are affected by any devices inserted into the signal path. ALT SOLO is not affected by the Insert.

33 ALT WEDGE LEVEL

An Alternate Wedge stereo output is provided, with its own level control. The feed to this output may either follow the Main Wedge or ALT SOLO, depending on the position of the SRC (Source) switch (see below). The ALT WEDGE dims with the Main Wedge.

34 ON

Pressing the internally illuminated ON switch enables the Alt Wedge output, independently of the Main Wedge.

35 SRC (Source)

When this switch is released, the Alt Wedge follows the Main Wedge, including the Mono Source switching, Wedge Insert and Wedge Fader (subject to the PRE switch, see below), but before the Main Wedge ON switch. When the SRC switch is pressed the Alt Wedge listens to ALT SOLO.

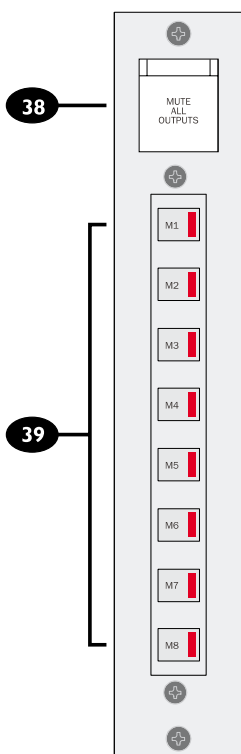
36 PRE

The feed from the Main Wedge to Alt Wedge is normally sourced post the main wedge fader, but may be switched to pre-fade by pressing the PRE switch.

37 PHONES

The engineer's phones (and Wedge Meter in the overbridge) are fed by the post-insert Wedge, pre Mono Source Wedge signal, but have a separate phones volume control. The headphone socket is recessed into the front of the fascia (and duplicated on the Master rear panel), and is driven by a high-power (1W into 8ohms) headphone amp.

MUTE MASTERS



38 MUTE ALL OUTPUTS

The MUTE ALL OUTPUTS switch will MUTE every Group and Matrix Output on the console (useful as either a 'panic' or 'desk unattended' switch). This switch is covered to prevent accidental triggering.

39 MUTE MASTERS

8 recessed latching buttons control the mute status of any channels assigned to the appropriate mute group.

Inputs may be assigned to any combination of the eight master mute busses. When an input channel is assigned to a mute bus, it is muted when the corresponding MUTE MASTER is pressed. The MUTE MASTER illuminates and the input channel MUTE switch also illuminates to indicate that a non-local mute is active.

VCA MASTER FADERS

These modules offer master controls for the 8 VCA Groups.

40 MUTE

Activating the MUTE on a VCA master will activate the MUTE on any slave input channel, allowing groups of inputs to be MUTED together with a single button press.

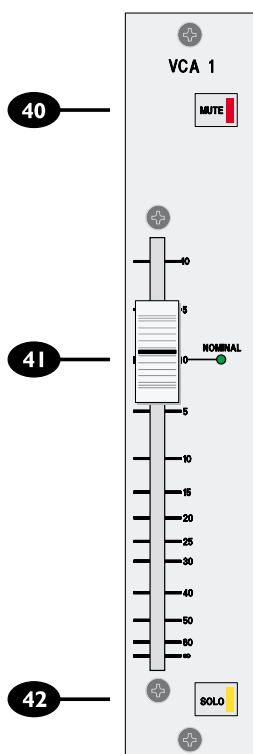
41 MUTE MASTERS

The attenuation or gain applied on a VCA Master Fader will be applied to all input faders assigned as slaves to that VCA. The VCA Master Fader has 10dB of gain in hand at the top of the fader.

The adjacent NOMINAL LED illuminates when the VCA Master Fader is at unity gain. This is useful as an aid in setting 'flat' VCA Masters when the console is configured as a logic-linked slave to another 'Master' FIVE Monitor console.

42 SOLO

Activating a SOLO on a VCA Master will activate the SOLO on any slave input channel, allowing groups of inputs to be PFL / AFL'ed together with a single button press.



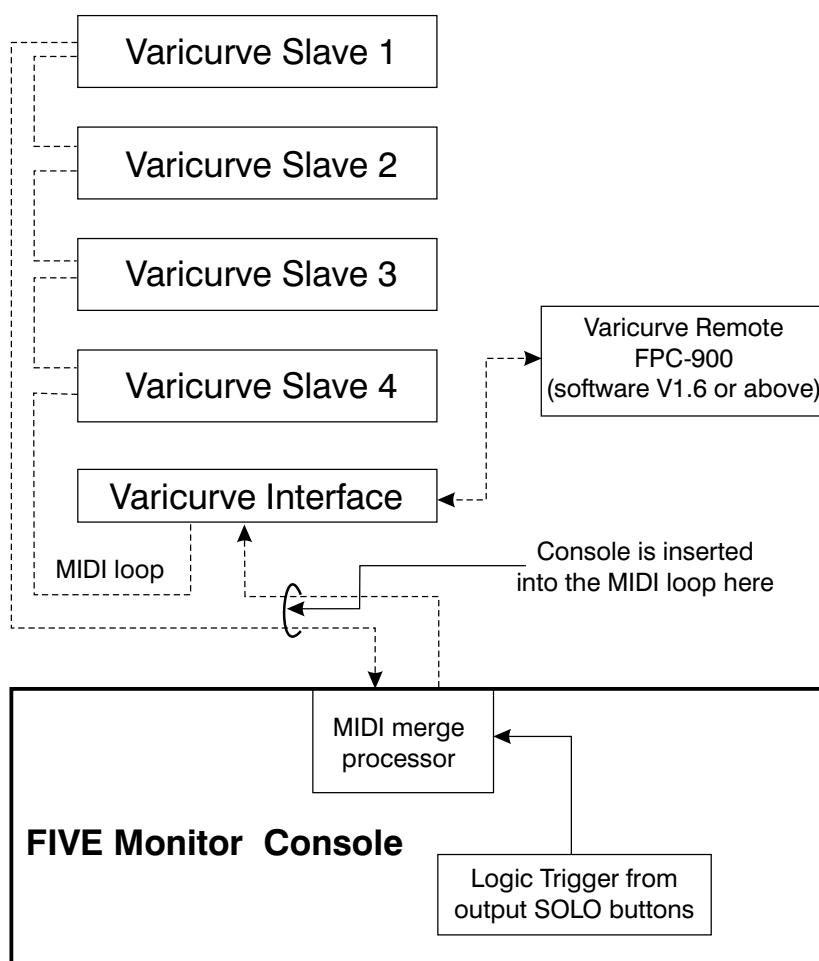
BSS VARICURVE™ REMOTE CONTROL

FIVE Monitor may be inserted into the MIDI loop of a BSS FPC-900 Varicurve™ Remote Control and Slave system (see diagram below.)

When so connected, pressing a SOLO on an Output of the FIVE Monitor will cause the necessary MIDI command to be sent to the Remote unit to SELECT the EQ associated with that Output, thus automatically bringing the EQ for the SOLO'ed channel onto the remote for editing.

This feature saves time when setting up and editing the EQ parameters for a Monitor rig, as the engineer no longer has to manually scroll through the various slave units to find the appropriate device to edit - a press of the SOLO on the FIVE Monitor will suffice.

Note that this function requires the Varicurve™ remote to be fitted with operating system EPROM V1.16 or above; contact BSS for further information.



LOGIC IN / LOGIC OUT

Rear Panel EDAC connectors are provided to link the logic systems of one FIVE Monitor with a second console in a Master/Slave configuration. See Chapter 2, Installation, for connection details.

Rearcon Panel

The connections on the Master rear connector panel are as follows:

All Audio XLRs

Pin 1	Gnd (Screen)
Pin 2	Hot (In-phase signal)
Pin 3	Cold(Out-of-phase signal)

3-pole 'A' gauge Jack - Inputs/Output (inc. Inserts)

Tip	Hot (In-phase signal)
Ring	Cold(Out-of-phase signal)
Sleeve	Gnd (Screen)

3-pole 'A' gauge Jack (Headphones)

Tip	Left Signal
Ring	Right Signal
Sleeve	Gnd (Screen)

4-pin XLR (Lamp Connection)

Pin 1 & 3	+/-12V max. current 400mA
Pin 4	0v

FIVE Monitor

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Specifications

Typical Specifications

Frequency Response

Any Input to any output 20Hz - 20kHz, +0/-0.5dB

Total Harmonic Distortion

All measurements at 20dBu

Line In to Direct Out (VCA out) Less than 0.006% @ 1kHz

Line In to Direct Out (VCA In) Less than 0.02% @ 1kHz

Line In to Mix Out (VCA out) Less than 0.008% @ 1kHz

Noise

22Hz - 22kHz bandwidth, unweighted

Mic input Equivalent Input Noise Less than -127dBu (150Ω source)

Group Output Noise Less than -80dBu (32 ch routed)

Mix Output Noise Less than -80dBu (32 ch routed)

Group Output Noise (residual) Less than -92dBu

Crosstalk

All measurements at 1kHz

Input Channel Muting Greater than 90dB

Input Channel Fader Isolation Greater than 90dB

Input Send Pot Routing Isolation Greater than 90dB

Group to Group Crosstalk Less than -90dB

Group to Mix Crosstalk Less than -90dB

Input and Output Impedances

Mono Input 1.6kΩ balanced

All Insert Sends Less than 75Ω balanced

All Insert Returns Greater than 10kΩ balanced

Outputs Less than 75Ω balanced

Input/Output Capability

Maximum Input Level +30dBu

All Insert Sends +26dBu into 1kΩ

All Insert Returns +26dBu

All Balanced Outputs +26dBu into 1kΩ

Headphone Output +20dBu into 1kΩ

..... 8W into 8Ω

Input and Output Levels

Mono Input Sensitivity (XLR) -2dBu to -70dBu, +10dBu to -20dBu

All Insert Send/Return +4dBu nominal

Outputs +4dBu for 0VU

Weights

24-bus, 44ch / 32-bus, 40ch 156kg (343lbs)

24-bus, 52ch / 32-bus, 48ch 170kg (374lbs)

24-bus, 60ch / 32-bus, 56ch 185kg (407lbs)